number—until the white and acid vapours cease to be disengaged. The vessel is then to be placed in a heated sand-bath, where it must remain until it acquires the temperature of the oil, similarly heated in another vessel, and in the same sand-bath; the oil is then to be added to the copal or amber. This mixture is to be diluted for use, by heating it, and a portion of highly-rectified spirit of turpentine, in separate vessels, to a similar degree of heat, in a sand-bath, and then mixing them together; if this precaution be not observed, a coagulum will be formed, and the copal or amber be precipitated in a solid mass.

If melted copal be dropped into water, a small quantity of oil is separated, which floats on the top, and the resin falls to the bottom, it is considered to be rendered, by this simple preparation, somewhat more soluble in the different menstrua.

We have now explained the theory of the composition of different kinds of varnish, and also the method of using the same. Here we must conclude, reserving the practical application, more especially the process termed "French polishing," as well as a large collection of recipes for making a great variety of varnishes for a future opportunity.—*Penny Mechanic.*

WHO SHOULD EMIGRATE?

CHAPTER IX.

"Let me look around and record the experiences of the last twenty years, of those now living in my neighbourhood, not individually but in classes, within a short distance of each other and many of their farms adjoining, live about thirty farmers, occupying five well farmed and well tilled farms, varying in size from two to four hundred acres each, all owned by the proprietors who reside upon them. These with half-a-dozen exceptions all came here without a dollar, and many of them in debt for the passage money that brought them over; and a few hundred dollars composed the whole of the wealth of the individual exceptions to the general rule of the absolute absence of property. They were mostly labouring men in England, some were little farmers in the habit of working with their own hands on their rented lands. Their scanty means in most cases were barely sufficient, and in most cases wholly inadequate to bring them to our settlement in Illinois, but they brought with them the habit of hard work, the power of labour. Most of these men hired out for one, two, or three years at first, after a short period some rented lands for one or two years more, or acquired lands of their own, hiring out at intervals to obtain a little necessary ready money, whilst the crops on their own lands were growing; most of them now have larger families which are growing or are grown up, many of their children are married and comfortably settled. Their whole career has been one progressive state of improvement in circumstances, habits, and attainments. This little community is one of the many examples of the sterling good qualities of English labourers, spending and improving under the free institutions of the United States; what would they have been in England? poor and dependant, and their children left in the same condition after them. Families who live by their labour and farm labourers may safely emigrate, not to the Atlantic towns, not to the crowded cities of America, but to the interior of the continent, where land, and bread, and meat, is cheap, where, if their services are not even wanted for hire, they can get on land, and raise their own provision. Next in order of certain success are all of the handicrafts, bricklayers, plasterers, sawyers, masons, carpenters, wheelwrights, blacksmiths, shoemakers, and all the various tradesmen necessary to an agricultural community. These assemble in our small towns, which are scattered in the interior of the new states, and find in them an ever-expanding field open for the successful enterprise of vast numbers of workmen. This class are too apt to confine themselves to the large towns. In the small towns in the interior it is that their services are in great demand; they there acquire property at a cheap rate, which is continually increasing in value. Thus they grow with the growth of the town and the country around them. They always do well, or might do well. Habits of intemperance in drink are more common among the mechanics than among the farmers. The drunkard is apt to blame the country rather than his own bad habits for his ill-success. They, however, feel the deprivation more than other men of social town habits. They miss their beer. This is too much; they may increase in property—they may want for nothing; but if the beer is lacking, they will often damn the country and all things in it. From the general success of this class, we may safely say that hard-working, industrious mechanics, who are pressed for means of subsistence in the old country, would do well to come to America."

CHAPTER XII.

"An European emigrant first coming into America changes his pounds sterling into dollars. This is a change for the better, for he gets many more dollars than he had pounds, and a dollar, for many purposes, in America goes quite as far as a pound sterling in England.

"A cow worth fifteen pounds in England, is worth fifteen dollars in Western America. A horse worth fifty pounds in England, is worth fifty dollars in Western America. Land in the Old States is worth about as many dollars as it is worth pounds in England.

"In the Western States land is much cheaper, clothing and labour dearer. Bread, meat, and fuel, much cheaper. Taking it on the average, a dollar in America is worth as much as a pound sterling in England. Let all who think of emigrating, as a last resource to a failing fortune, come out in time, and not wait until they have lost their all. By gamblers it is reckoned a desperate chance to risk the last shilling.

"What an imperative duty rests upon the father of a family if he has thoughts of emigrating, to stop in time, whilst he has yet two thousand, one thousand, or five hundred pounds in his possession. How improvident is *his* conduct who flies to a new country not possessing the power of labour, with a large family, and without a dollar! More than senseless are his fruitless complaints that he cannot find a comfortable living when he gets there. Yet there are such!

"Those who have saved a thousand pounds for investment, will find when it is turned into dollars, that it will count four thousand four hundred and forty-four dollars; and for all the purposes of life will go as far as many pounds in England."

The foregoing extracts we have much pleasure in selecting from a useful and interesting compendium bearing the title of "Errors of Emigrants." It contains twenty-one chapters or letters, purporting to be addressed by a Mr. George Flower, of Albion, Edward's County, Illinois, to his brother Edward Fordham Flower, of Stratford-on-Avon, Great Britain. We have not seen any thing within the compass and price of this work (one shilling) of a more practical character, and Mr. Cleave deserves well for its publication. The difficulties of emigrants, the means of their obtaining correct information, the methods of farming and advice thereupon, and as to realizing stock, advice on the selection of land, both as to quality and quantity, and also as to price; the locality to be made choice of; the state of circumstances of emigrants; annoyances; money and currency; an account of Rapp and Owen's settlement, and a large variety of equally important information and subjects are gone into. The selection we have made will give a fair specimen of the character of the work, and since we know that its contents are of consequence to many of our readers, we have performed an agreeable duty in thus far bringing them acquainted with it.

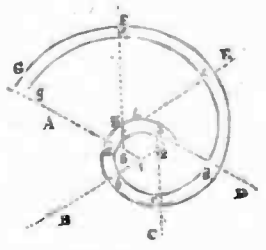
CURVES OF FANCY EQUATED.

TO THE EDITOR.

Problem VI.—*To describe a spiral from any number of equidistant centres (say six).*—Let 1 2 3 4 5 6 be a regular hexagon produce the sides 2 1, 3 2, &c.

With 1 as centre, and any distance 1 *a*, describe the arc *a b*; with 2 as centre, and distance 2 *b*, describe the arc *b c*: then with 3 as centre, and distance 3 *c*, describe the arc *c d*, and so on the spiral may be continued at pleasure.

If necessary, it may be composed of a double, &c. line. From this similar constructions with other polygons are easily made.



BUILDERS' DRAWING SCHOOL, OR A SCHOOL FOR A DUE CULTIVATION OF THEIR FACULTIES FOR THE ARTS.

TO THE EDITOR.

Sir,—In your most useful work The Builder of last week, I saw there were in the Leader many admirable remarks made upon a most important matter, *the formation of a Builders' School.* The very name must astonish every artist, and almost make him fancy that he had in some measure lent a helping hand to keep from that valuable class of persons the school they are in such great need of. It is not a little surprising to see announced publicly, that a school for builders should be established. One would have supposed that schools for builders had been established since the days of Alfred. Have we arrived at the year 1843, and now begin to consider it is high time that the builders should have a school in, which their faculties for the arts should have a legitimate training—and such a school is now considered necessary—so that the extraordinary drawing schools at Exeter Hall and Somerset House are—for what? The builders say they do not know. Do the Government Council of Education know? Perhaps not so much as the builders, who have given them trial, and have found that the prisms of the one, and the carvings of the other, are out of harmony with their faculties for the arts, and that such instruction amounts to a drawback on their understandings—the matter they are not in search of. Builders, because they are builders, do not want to be made bad artists of, or artificialists, which is the same thing. Surely a carpenter, a cabinet-maker, a picture-frame-maker, an upholsterer, a carver, a mason, a bricklayer, &c., would execute their work all the better for being naturalists, and if so, all the worse for being artificialists, and in which quality the government schools propose to perfect them. Is this, then, the end of the wisdom of the Council of Education? Surely the Council of Education are not aware of their having established the wrong thing; or have the council discovered that when our glorious houses of prayer, the cathedrals, were erected, that the designers and builders of them were taught drawing according to the prism system at Exeter Hall, and design by artificial curves and stone foliage designs at Somerset House? The only reason for the council having established such a backward and round-about system wherewith to enlighten the public, would be in their having discovered that such great works were the result of such a system of prism drawing teaching as taught at Exeter Hall, and stone foliage designing as developed in Somerset House. And should such a discovery have been made, we must then set ourselves to work to ascertain in what way the faculties for the arts arrive at a knowledge of the works of creation. That a knowledge of the different sciences is indispensably necessary to an understanding of the matter to which they relate, every one must admit: but then let the time that certain persons have only to spare for obtaining a certain end be most correctly applied, and as immediately as possible to the point they want to arrive at, and not send the Londoners to Edmonton as the best route for arriving at Brentford. All round-about methods of communicating information should be abolished, and a straight path should be made for the poor and our artisans to walk in; for the well-intentioned of them have neither time nor money to waste on erroneous notions, but what they have to spare should be applied to sound information, such as would facilitate them in their various callings, and be the means of their improving daily in the different departments of the building craft in which they happen to be placed. A school for drawing and design for the purpose of bringing the working classes forward in those important matters, requires much consideration, and without its being well digested and based upon a natural foundation, it will be to them worse than useless. No one will learn to draw correctly, or design consistently, by being subjected to capricious and artificial forms: such arrangements for drawing teaching must be condemned in the strongest terms possible, that the faculties for the arts may not be corrupted, and when thus injured, are beyond the pale of recovery. We must, therefore, do the utmost in our power to correct the present evil of wrong teaching, that each individual may be saved from the mischief that he would otherwise fall into. It must not be supposed that any kind of artificial teaching will do for the working classes, because they are mechanics and not artists: for, on the contrary, the most sound arrangement should be made for them, that the least possible time as well as expense should be given, and the right kind of information obtained, such as will be made available by them, and turned to the utmost possible account in every part of their craft. Defective instruction should not be imparted to any one, much more to mechanics, for their usefulness entirely depends upon accuracy, and it is the power to perceive and represent true form that they are so much in want of, and to accomplish this important end should be the business of the instructor. The mechanics have been greatly neglected in their education, and however limited it may be, yet, what there is of it should be of the best kind. But up to this time the faculties for the arts of the poorer classes are not cultivated. A little artificial drawing done from other artificial drawings, is about the utmost that they obtain from various schools. This is far from cultivation, it may even do more mischief than good: for the Creator has given all the faculties for legitimate training; and as they are

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